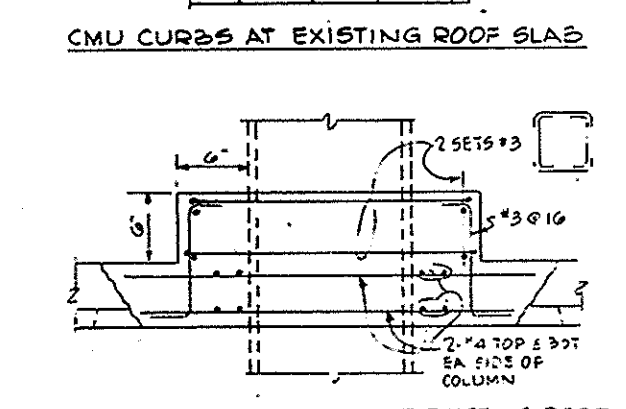
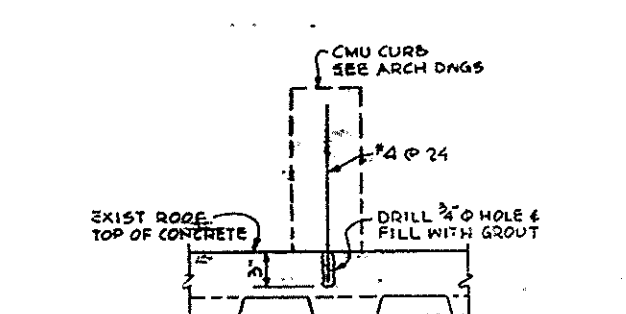
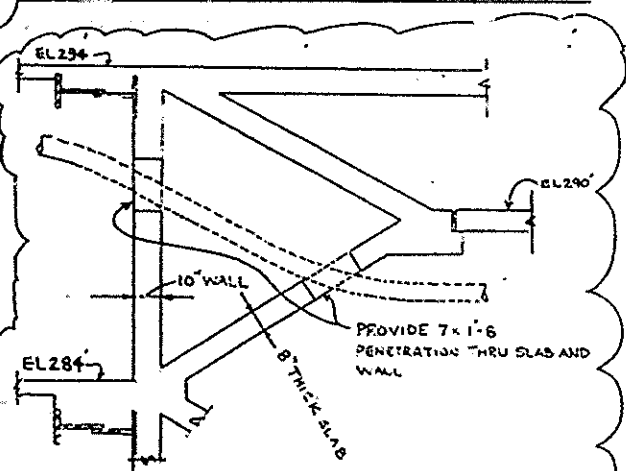


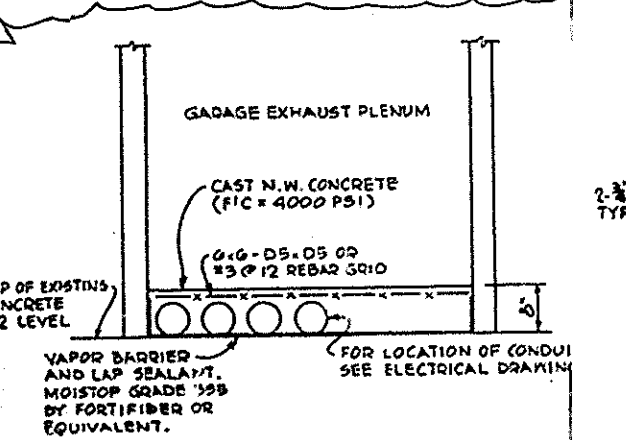
1. FOR SIZE AND LOCATION SEE ARCHITECTURAL, MECHANICAL AND STRUCTURAL DRAWINGS.
2. ROUGHEN SURFACE OF SLAB, CLEAN THOROUGHLY AND APPLY EPOXY BONDING COMPOUND IMMEDIATELY BEFORE CASTING CURB OR PAD.



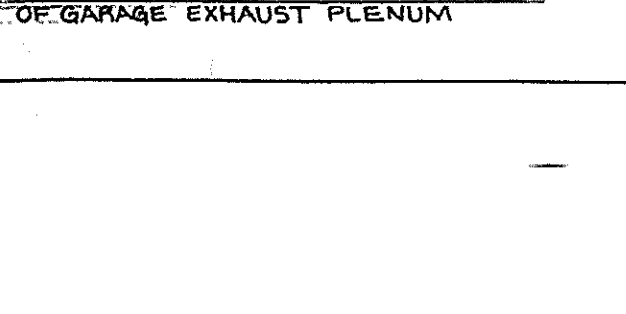
CURB AT COLUMN STUBS AT EXISTING ROOF



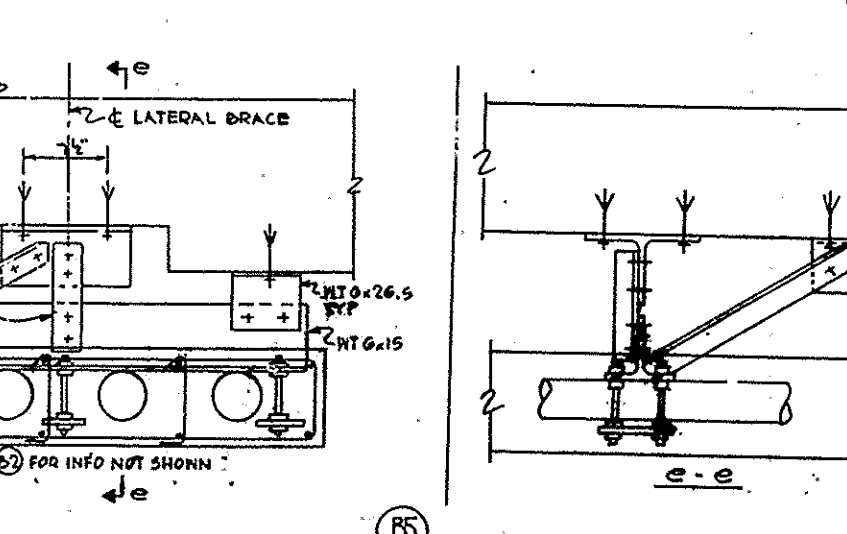
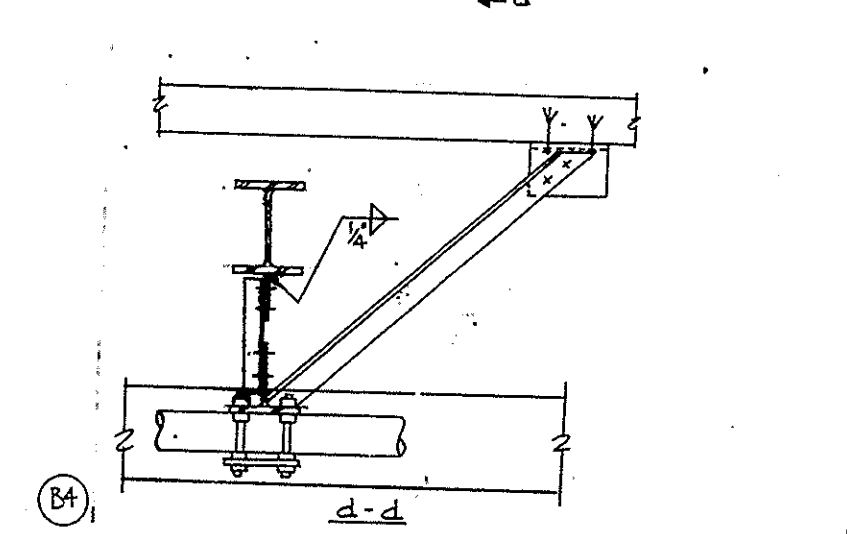
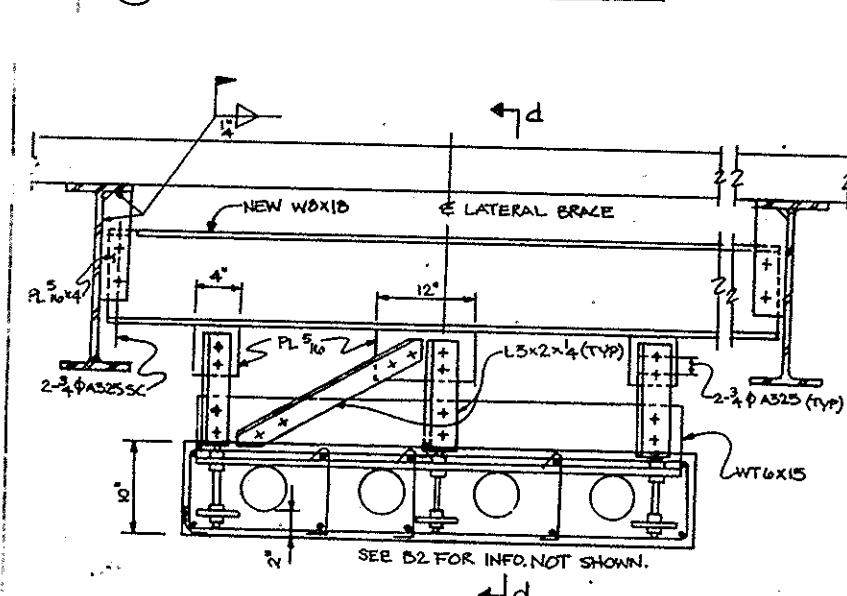
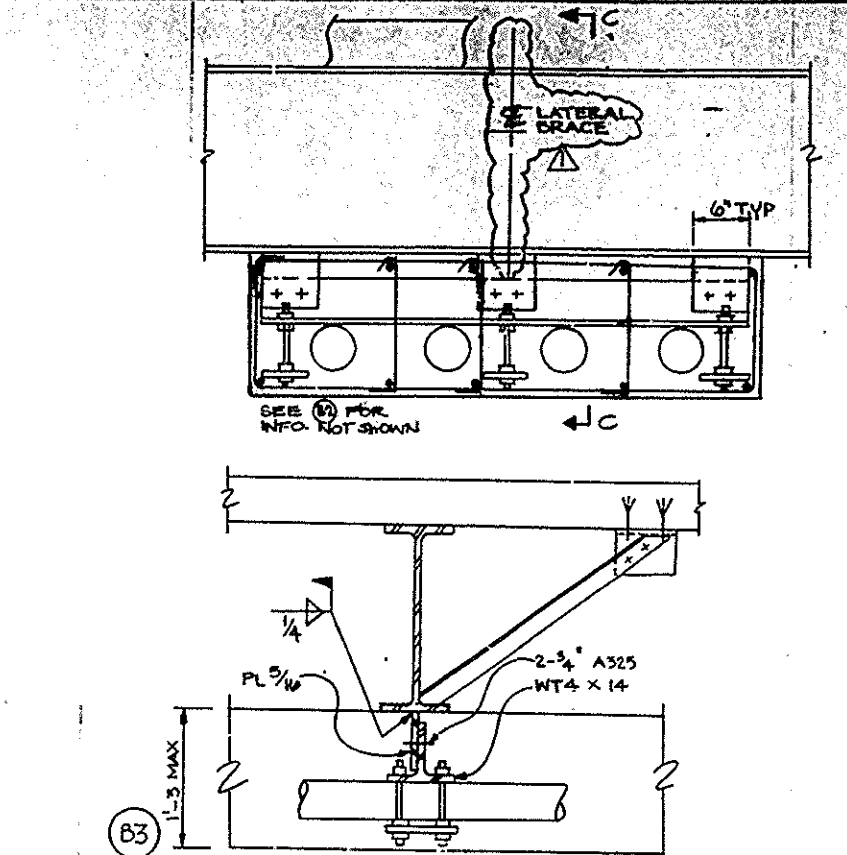
CONCRETE CURBS & PADS



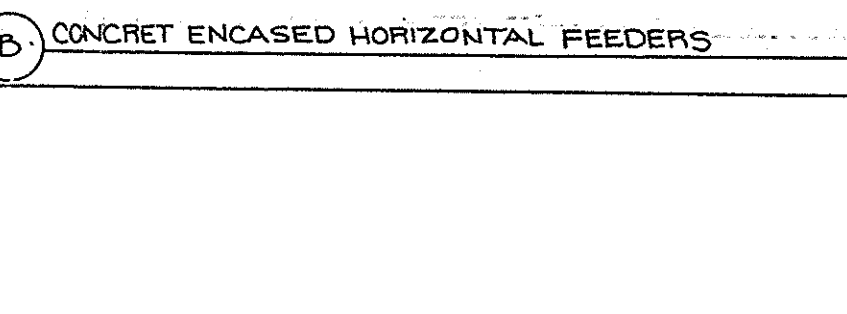
FEEDER PENETRATION THROUGH B2 LEVEL WALL OF 3WTC AND 2WTC



HORIZONTAL CABLE DETAIL AT FLOOR OF GARAGE EXHAUST PLENUM

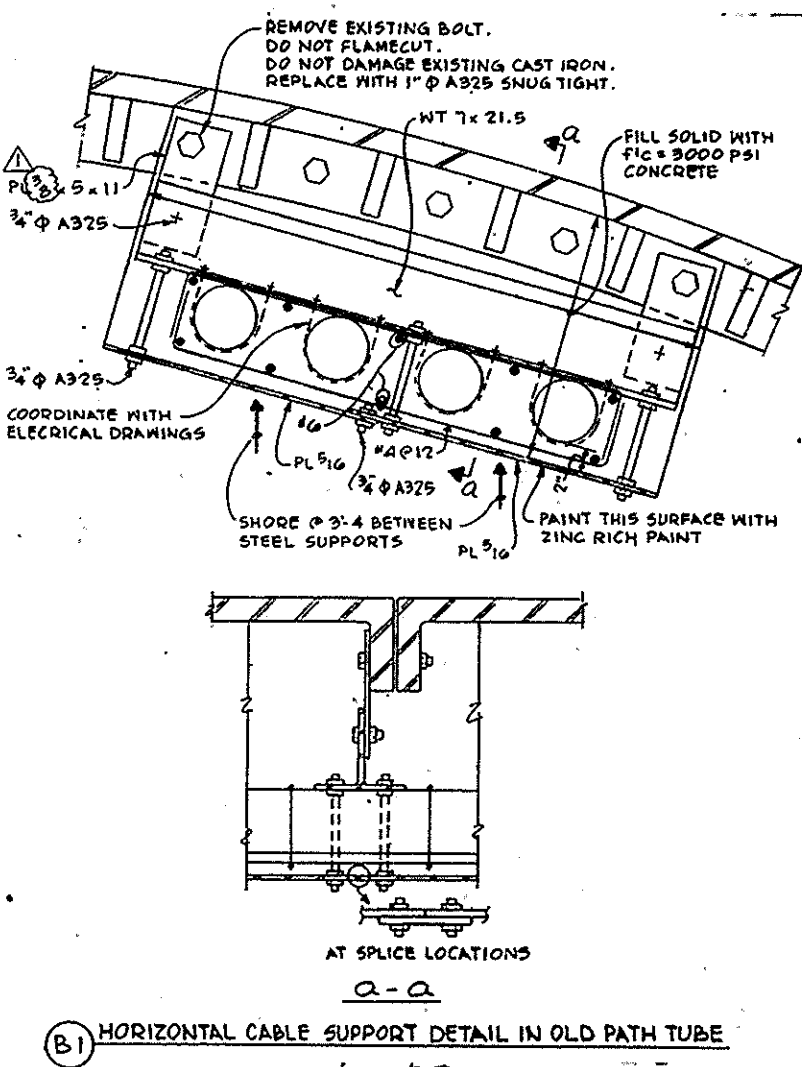


CONCRET ENCASED HORIZONTAL FEEDERS

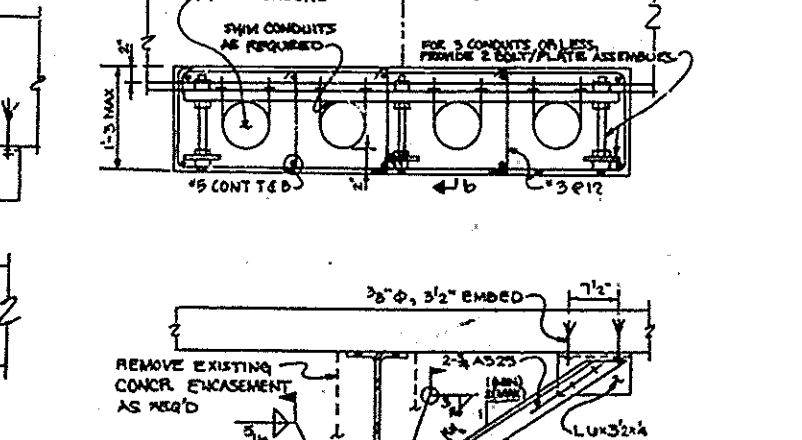


CONCRET ENCASED HORIZONTAL FEEDERS

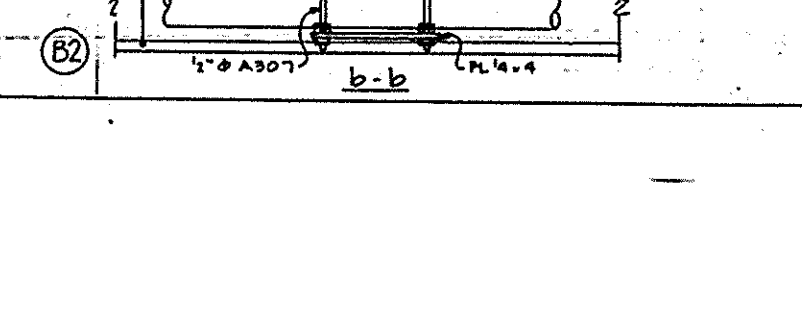
- NOTES FOR CONCRETE ENCASED HORIZONTAL FEEDERS:
1. CONTRACTOR SHALL VERIFY THE WORK SITE AND SELECT LOCATIONS FOR FEEDER SUPPORT BRACKETS. TYPICAL DETAILS SHOWN VARIOUS BRACKET CONFIGURATIONS THAT ACCOMMODATE COMPLICATED FIELD CONDITIONS. NOT ALL CONDITIONS HAVE BEEN CONTEMPLATED. CONTRACTOR SHALL PROPOSE ALTERNATIVE BRACKET CONFIGURATIONS AS REQUIRED TO ACCOMMODATE ACTUAL CONDITIONS.
 2. CONTRACTOR SHALL PREPARE AND SUBMIT SHOP DRAWINGS OF FEEDER BRACKETS. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING:
 - a) BRACKET LOCATION DRAWINGS INCLUDING PLAN LOCATION AND ELEVATION AND THE DESIGNATION OF EACH BRACKET TYPE. DRAW TO 1/8\"/>
 3. UNLESS OTHERWISE NOTED, PROVIDE SUPPORT BRACKETS AT 5'-0\"/>
 4. IN ADDITION TO THE REQUIRED BRACKET SPACING IN NOTE 3, PROVIDE BRACKETS AT ALL LOCATIONS WHERE:
 - a) FEEDERS CHANGE DIRECTION, EITHER VERTICALLY OR HORIZONTALLY.
 - b) IMMEDIATELY ADJACENT TO PENETRATIONS THROUGH WALLS.
 - c) WHERE A SINGLE CABLE DIVERGES FROM A GROUP OF CABLES.
 5. LATERAL BRACING SHALL BE PROVIDED AT ALTERNATE BRACKET LOCATIONS AS SHOWN IN THE TYPICAL DETAILS. ADDITIONALLY, LATERAL BRACES SHALL BE PROVIDED AT CHANGES IN DIRECTION AND AT WALLS PER NOTE 4.
 6. STRUCTURAL STEEL FOR BRACKETS SHALL BE FY 36. (SHOP PRIMS PER GENERAL NOTES)
 7. CONCRETE ENCASEMENT SHALL BE F'C = 3000 PSI.
 8. AFTER SET CONCRETE ANCHORS SHALL BE MAXI BOLT BY DRILLCO DEVICE LTD.
 9. COMPENSATION FOR INSTALLATION OF FEEDER SUPPORT BRACKETS AND CONCRETE ENCASEMENT INCLUDING REMOVAL AND REPLACEMENT OF EXISTING CONSTRUCTION IN THE WAY WILL BE PAID FOR AT THE NET COST THEREOF. NET COST SHALL BE COMPUTED IN THE SAME MANNER AS IS COMPENSATION FOR EXTRA WORK, INCLUDING ANY PERCENTAGE ADDITION TO COST, AS SET FORTH IN THE CLAIM OF THE CONTRACT PROVIDING COMPENSATION FOR EXTRA WORK. COMPENSATION FOR SAID NET COST WORK SHALL NOT BE CHARGED AGAINST THE TOTAL AMOUNT OF COMPENSATION AUTHORIZED FOR EXTRA WORK.



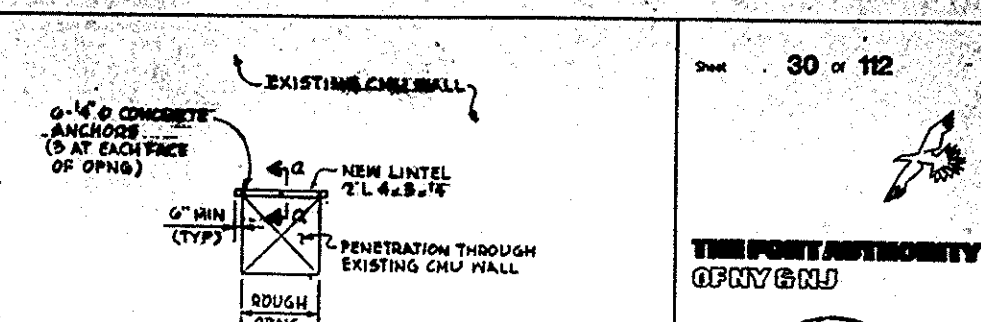
HORIZONTAL CABLE SUPPORT DETAIL IN OLD PATH TUBE



HORIZONTAL CABLE SUPPORT DETAIL IN OLD PATH TUBE



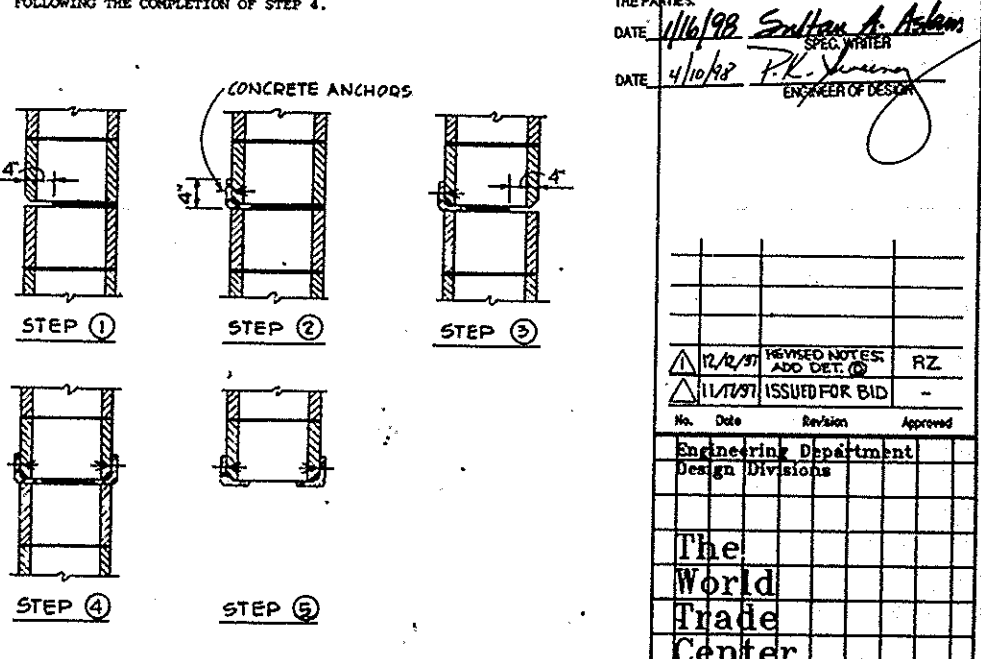
HORIZONTAL CABLE SUPPORT DETAIL IN OLD PATH TUBE



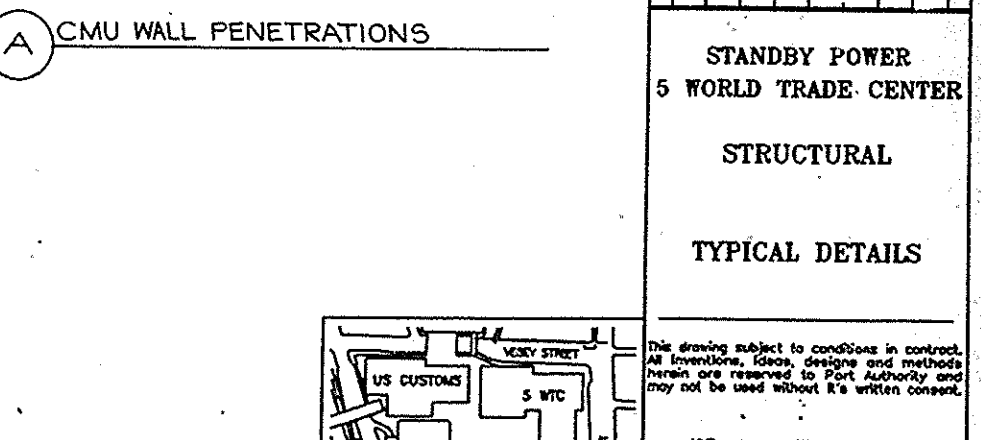
ELEVATION OF EXISTING CMU WALL

- GENERAL NOTES:
1. STRUCTURAL STEEL SHALL BE ASTM A36. SHOP PRIMS PER GENERAL NOTES.
 2. CLEAN STEEL WITH A POWER WIRE BRUSH TO REMOVE LOOSE MILL SCALE, RUST, DIRT AND OTHER FOREIGN MATERIALS. SHOP TOUCH UP WITH SA-2.
 3. CEMENT GROUT SHALL BE NON-SHINK CONFORMING TO ASTM C1107 AND SHALL BE FILLER AND BAGGED BY MANUFACTURER.
 4. CONCRETE ANCHORS SHALL BE HILTI DROP-IN ANCHORS OR EQUIVALENT INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
 5. COMPENSATION FOR CMU WALL PENETRATIONS INCLUDING CUTTING, REINFORCING, PATCHING, AND REMOVAL AND REPLACEMENT OF EXISTING CONSTRUCTION IN THE WAY WILL BE PAID FOR AT THE NET COST THEREOF. NET COST SHALL BE COMPUTED IN THE SAME MANNER AS IS COMPENSATION FOR EXTRA WORK, INCLUDING ANY PERCENTAGE ADDITION TO COST, AS SET FORTH IN THE CLAIM OF THE CONTRACT PROVIDING COMPENSATION FOR EXTRA WORK. COMPENSATION FOR SAID NET COST WORK SHALL NOT BE CHARGED AGAINST THE TOTAL AMOUNT OF COMPENSATION AUTHORIZED FOR EXTRA WORK.

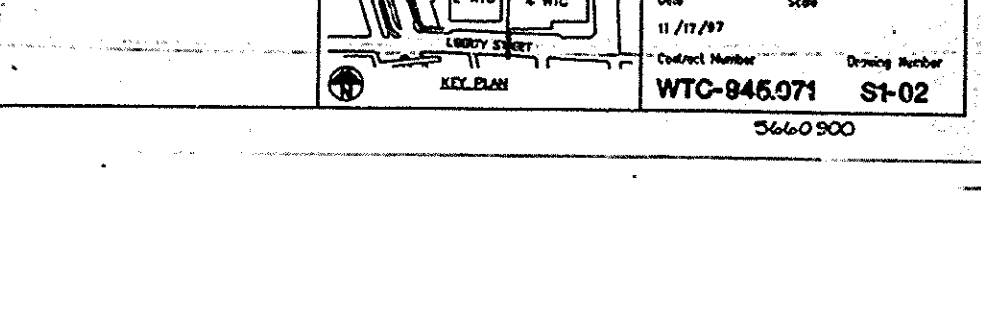
- BASIC PROCEDURE:
- STEP 1
LOCATE THE MORTAR JOINT THAT DEFINES THE TOP OF THE ROUGH OPENING. ROUTE THE MORTAR JOINT OF THE WALL TO RECEIVE THE ANGLE. HAVE THE EDGE OF THE BLOCK TO CLEAR THE FILLET OF THE ANGLE. SAW CUT THE VERTICAL EDGES OF THE ROUGH OPENING.
 - STEP 2
SET THE ANGLE, AFTER FIRST FILLING THE ROUTED SPACE WITH A STIFF CEMENT GROUT SO AS TO OBTAIN FULL BEARING, TOP AND BOTTOM. DRIVE THE ANGLE INTO THE SPACE WITH A HAMMER. INSTALL CONCRETE ANCHORS.
 - STEP 3
NOT LESS THAN 24 HOURS AFTER INSTALLING THE ANGLE ON THE ONE SIDE OF THE WALL, REPEAT STEP 1 ON THE OTHER SIDE OF THE WALL.
 - STEP 4
SET THE ANGLE FOLLOWING THE PROCEDURE IN STEP 2.
 - STEP 5
DEMOLITION OF THE WALL BELOW CAN PROCEED IMMEDIATELY FOLLOWING THE COMPLETION OF STEP 4.



CMU WALL PENETRATIONS



CMU WALL PENETRATIONS



CMU WALL PENETRATIONS

Sheet 30 of 112

THE PORT AUTHORITY OF NY & NJ

ORIGINAL SIGNED & SEALED BY N.Y. P.E. (OR R.A.)

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I HEREBY CERTIFY THAT THIS IS A TRUE AND CORRECT COPY OF ONE OF THE CONTRACT DRAWINGS, CONSTITUTING A PART OF CONTRACT NO. WTC-945071, IN THE FORM IN WHICH SAID DRAWINGS WERE SUBMITTED TO THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY FOR THE TIME THE SAID CONTRACT WAS EXECUTED BY THE PARTIES.

DATE: 4/16/92 *Sultan A. Adam* SEAL
DATE: 4/16/92 *P.L. Young* SEAL
DATE: 4/16/92 *P.L. Young* SEAL

No.	Date	Revision	Approved
1	12/2/91	REVISED NOTES	RZ
2	11/17/91	ISSUED FOR BID	

Engineering Department
Design Divisions

The World Trade Center

STANDBY POWER
5 WORLD TRADE CENTER

STRUCTURAL

TYPICAL DETAILS

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

WTS
Designed by
JAL
Drawn by
RZ
Checked by

Date
11/17/91

Scale

Contract Number
WTC-945071

Sheet Number
S1-02

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